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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 05/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/627,522	Applicant(s) TAYLOR ET AL.	
	Examiner Tracy Dove	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-83 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-83 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This Action is in response to the communication filed on 2/9/04. Applicant's arguments have been considered, but are not persuasive. Claims 30-83 are pending. Claims 1-29 have been canceled. This Action is made FINAL, as necessitated by amendment.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 30-83 are provisionally rejected under the judicially created doctrine of double patenting over claims 51-90 of copending Application No. 09/696,109. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

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The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both the instant application and the copending application claim a grid supporting structure having an active material pasted thereto or a lead-acid battery containing the grid supporting structure. The grid comprises a lead-based alloy including lead, tin, calcium and silver. The claimed ranges for the lead-based alloy components of the instant application overlap those of the copending application. Regarding instant claims 57-70 and 72-83, "a plate formed by book mold gravity casting for use in a battery comprising a lead-based alloy" is claiming common subject matter as the copending application because one of skill would have known that a battery comprises a container, a positive plate, a negative plate and a separator.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See also MPEP § 804.

*

Applicant is advised that should claims 58-70 be found allowable, claims 73-83 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 44-56, 59-61, 68, 70, 74-76 and 83 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 44 recites limitations regarding "a layer of active material" and a "SLI battery". Claim 44 is directed toward "A grid supporting structure" and not an electrode or a battery. The last three lines of claim 44 should be deleted.

Claim 51 improperly broadens the claim from which it depends. Specifically, claim 44 recites the silver is in the range of greater than 0 to less than 0.015%. Thus, the limitation in "about 0%" broadens claim 50 because "about 0%" includes the value zero. Note claim 51 does not appear to further limit claim 50.

Claims 59-61 improperly broaden claim 58 because "about 0.0124%" is broader than "less than 0.0124%". Regarding claim 61, "0.015%" is outside the claimed silver range of claim 58. Note claim 60 does not appear to further limit claim 59.

Claim 68 improperly broadens claim 58. Claim 68 does not appear to further limit claim 58.

Claim 70 is improper. Claim 57 is directed to a plate. The plate does not comprise an active material. An electrode comprises the plate and the active material. Furthermore, the active material does not comprise the paste. The paste comprises the active material.

Claims 74 and 76 improperly broaden claim 73.

Claim 75 does not appear to further limit claim 74.

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Claim 83 is improper. Claim 72 is directed to a plate. The plate does not comprise an active material. An electrode comprises the plate and the active material. Furthermore, the active material does not comprise the paste. The paste comprises the active material.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 30-83 are rejected under 35 U.S.C. 102(e)/103(a) as being anticipated by, and alternatively unpatentable over, Larsen et al., US 5,948,566.

Larsen teaches a sealed lead-acid battery (col. 11, lines 35-39) having a positive plate, a negative plate and a separator between the plates (col. 8, lines 20-36). An active material paste is applied to a grid supporting structure to form the positive plate (col. 7, lines 24-43). The positive grid alloy comprises a lead-based calcium-tin-silver alloy in which, based upon the total weight of the alloy, calcium is present in a range of from about 0.01% to 0.06%, tin is present in a range

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of from about 0.3% to 1.0% and silver is present in a range of about 0.01% to 0.06%. Note the ratio of tin to calcium may be greater than 20:1. Optionally, aluminum can be included in an amount from about 0.003% to 0.010%. See col. 11, lines 7-14. The sealed lead-acid battery may be used in automotive applications (col. 10, lines 64-67).

Thus, the claims are anticipated.

The claims are alternatively unpatentable. The claim limitation "formed by book mold gravity casting" is a product-by-process limitation. The courts have ruled that product-by-process limitation, in the absence of unexpected results, are obvious. In re Fessman. Thus, whether the grids are made by gravity casting or direct casting, the lead alloy grids are the same. Furthermore, Larsen at least suggests the grids may be made by gravity casting. Larsen teaches it is known to form grids by gravity casting techniques (col. 2, lines 18-19) and that such grids have been made by utilizing gravity casting and a number of molds (col. 2, lines 38-39).

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Claims 30-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsen, US 6,423,451.

Larsen teaches a sealed lead-acid cell having a container, a positive plate, a negative plate and a separator between the positive and negative plate (col. 8, lines 30-42). The positive plate comprises a grid and a positive active material pasted onto the grid (col. 8, lines 8-12). Larsen teaches that the grid supporting structure comprises a lead-based alloy consisting essentially of lead, from about 0.02% to about 0.05% calcium, from about 1.5% to about 3.0% tin and from about 0.01% to about 0.05% of silver (see abstract). Note the tin to calcium ratio is greater than 20:1. Optionally, the alloys can include from about 0.003% to 0.03% by weight of aluminum

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(col. 5, lines 8-9). Larsen teaches that the grids may be formed by conventional casting techniques such as gravity casting ("book molds" or the like) and continuous processes using expanded metal techniques (col. 2, lines 25-32 and col. 7, lines 40-47). The grids of Larsen may be used in any lead-acid cell or battery including, for example, automotive (flooded starting, lighting and ignition), bipolar and the like (col. 12, lines 12-17). Table 4 teaches a specific lead based alloy grid having 2.0% tin, 0.006% silver, 0.040% calcium and the balance lead. Note the alloy (Alloy E) has a ratio of tin to calcium of 50:1 (2/0.04).

Larsen does not explicitly disclose a grid supporting structure having the alloy composition of the instant claims.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). See MPEP 2144.05.

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Claims 30-32, 34-43, 57 and 70 are rejected under 35 U.S.C. 102(e) as being anticipated by, and alternatively under 35 U.S.C. 103(a) as being unpatentable over, Rao et al., US 5,691,087, as evidenced by Rao et al., US 5,874,186.

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Rao teaches a sealed lead-acid cell or battery having positive plates made from an alloy of lead, from about 0.025 to about 0.06% calcium, from about 0.3 to about 0.9% tin and from about 0.015 to about 0.045% silver. See abstract. Rao discloses manufacturing the grids by gravity casting and adding aluminum to the lead alloy in an amount of from about 0.008 to about 0.0120%, however up to 0.03% of aluminum may be used. See col. 8, lines 13-29. Figure 7 shows a lead-acid cell having a container 92 containing a plurality of positive and negative plates 94,96. The plates are separated by absorbent separators 98. Figure 6 shows the positive plate has a grid supporting structure 80 containing an active material. See col. 18, line 66- col. 19, line 30. In general, the tin content employed in the lead-based alloy will be in the range of 12-18 times that of the calcium content (col. 10, lines 20-22). Figure 1 shows a maintenance-free battery. Claim 1 recites a sealed cell. Rao teaches the disclosed lead-acid battery is used in an automobile (col. 9).

Regarding claims 32 and 38 Rao teaches the ratio of tin to calcium may be 20:1 or greater. The calcium content of the lead alloy may range from 0.025-0.06%, while the tin content of the alloy may range from 0.3-0.9% (abstract). Thus, if the calcium content is 0.025% the tin content would be 0.5-0.9% of the lead alloy to provide a tin to calcium ratio not less than 20:1. If the tin content is 0.9% of the lead alloy, the calcium content may be 0.025-0.045% to provide a tin to calcium ratio of not less than 20:1.

The alloys of Rao can be produced by such conventionally used techniques as gravity grid casting machines by using book molds (col. 10, lines 37-40). The most widely used technique for making SLI battery grids has been the conventional book mold gravity casting technique (col. 4, lines 25-27).

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Thus the claims are anticipated.

The claims are alternatively unpatentable under 35 U.S.C. 103(a) because while Rao '087 does not have a specific teaching within the claimed range of instant claims 30 and/or 57, unduly high silver levels may cause brittleness in the cast strip of the grid structure (evidenced by Rao '186, col. 16, lines 35-37). Rao '186 further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao '186 teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges of Rao '087 to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy of Rao '087 to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip. This is evidenced by Rao '186.

Note the Rao patent uses language such as "about" to describe the ranges of calcium, tin and silver in the lead-based alloy. Claim language such as "about" is interpreted broadly when applying prior art.

Response to Arguments

Applicant's arguments filed 2/9/04 have been fully considered but they are not persuasive.

Larsen et al. 5,948,566

Applicant argues Larsen teaches "industrial cells". However, the abstract states "for industrial cells **and** batteries for stationary and motive power applications". The thickness of the

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grid is not relevant to the claimed invention because the claims do not contain any limitations regarding thickness. Furthermore, the instant claims recite either "A lead-acid cell", "A grid supporting structure" or "A plate". The limitations regarding "for an SLI battery configured for use in vehicle applications" in the instant claims is merely an intended use limitation and is not given patentable weight. Larsen is not limited to the specific alloys disclosed in the specification and a specific example does not have to be disclosed in order for Larsen to teach the claimed invention with "sufficient specificity". In order to show unexpected results, Applicant must distinguish the instant invention over the prior art (Larsen). Applicant has not provided sufficient evidence of unexpected results. Furthermore, the instant specification teaches the grids to not have cracks. The abstract of Larsen teaches the grids are "crack-free". Thus, Larsen does have an understanding of the effects realized by the claimed lead-based alloy.

Note "formed by book mold gravity casting" is a product-by-process limitation.

Unexpected results have not been provided for the book mold gravity casting process of the claimed invention.

Larsen 6,423,451

Applicant argues none of the specific examples of Larsen disclose the claimed range of tin in the lead based alloy. However, an anticipation rejection was not applied against the claimed invention in view of Larsen '451. The instant claims recite either "A lead-acid cell", "A grid supporting structure" or "A plate". The limitations regarding "for an SLI battery configured for use in vehicle applications" in the instant claims is merely an intended use limitation and is not given patentable weight. Applicant does not provide any evidence of unexpected results for the claimed lead alloy composition.

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Rao et al. 5,691,087

Applicant argues that the claimed lead-tin-calcium-silver alloy is not identically disclosed by Rao et al. '087. However, Rao does teach a lead-tin-calcium-silver alloy having amounts of tin, calcium and silver that overlap the range amounts of tin, calcium and silver in the claimed lead-based alloy. Specifically, about 0.015% of silver (disclosed by Rao) teaches values slightly less than 0.015%. Rao is not limited to any preferred embodiment.

Applicant points to evidence of unexpected results shown in the declaration (Paper #18). However, the declaration does not show evidence of unexpected results because it is known that unduly high silver levels may cause brittleness in the cast strip of the grid structure (evidenced by Rao '186, col. 16, lines 35-37). Rao '186 further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao '186 teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges of Rao '087 to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy of Rao '087 to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip. This is evidenced by Rao '186.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 4, 2004


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